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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,294	09/11/2003	Shoji Hashimoto	116442	3573

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EXAMINER

MILLER, TAKISHA S

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/659,294

Applicant(s)

HASHIMOTO ET AL.

Examiner

Takisha Miller

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED Final ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollander (3,145,563) in view of Fenner (3,251,222).

- a. With respect to claims 1 and 3, Hollander teaches a force sensing element comprising a gauge portion (10) which is formed a p-type semiconductor substrate/lead telluride (PbTe)(Col. 2, lines 9-13) and which is pressed in a thickness direction (15) of the semiconductor substrate (10) upon receiving a force (Col. 3, lines 3-6) and a plurality of electrodes (16) which are electrically connected to the gauge portion (10) such that a current path extending in a direction corresponding to the thickness direction (15) of the semiconductor substrate (10) is formed in the gauge portion (10)(Fig. 1). Hollander fails to teach an electric output voltage path extending in a direction corresponding to the thickness direction of the substrate. Fenner teaches an electric output voltage path (12) extending in a direction corresponding to the thickness direction of the substrate (Fig.2). It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify Hollander to include the above limitation as taught by Fenner in order to create an isotropic semiconductor body having a uniform thickness throughout (see Fenner; Col. 4, lines 3-13).

b. With respect to claims 2 and 3, Hollander teaches a force sensing element wherein the current path is so confined as to be formed in a certain part of the gauge portion (10)(Col.2, lines 45-52).

c. With respect to claim 4, Hollander teaches a force sensing element wherein a center of a region (10a) receiving a force of the gauge portion (10) is located at a center of a region to which the force is applied (Fig. 1).

d. With respect to claims 5 and 6, Hollander teaches a force sensing element wherein the gauge portion (10) is formed such that the current path is formed in a crystal direction which exhibits a high sensitivity for a transmitted force (Col.3, lines 17-33).

e. With respect to claim 7, Hollander teaches a force sensing element wherein the electrodes (16) include a first electrode (16/top) which is electrically connected to the gauge portion (10) and a second electrode (16/bottom) which is so formed on the other face (10a) of the semiconductor substrate (10) as to face the first electrode (16)(Fig.1)(Col. 3, lines 46-52).

4. Claims 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollander in view of Fenner as applied to claims 1 and 3 above, and further in view of Akeel (5,526,700).

a. With respect to claims 8 and 10, Hollander in view of Fenner teaches a force sensing element comprising a piezoresistance gauge portion (10) which is formed on one main face of a semiconductor substrate (PbTe) and which is pressed upon receiving a

force, a plurality of electrodes (16) which are electrically connected to the gauge portion (10) such that a current path and an electric output voltage path extending in a direction corresponding to a thickness direction of the semiconductor substrate is formed in the gauge portion (10). Hollander in view of Fenner fails to teach a force transmission block. Akeel teaches a force transmission block (16)(Fig. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hollander in view of Fenner to include a force transmission block as taught by Akeel in order to effectively apply a force along the force sensitive axis of the semiconductor (see Akeel; Col. 3, lines 23-38).

b. With respect to claim 9, Hollander teaches a force sensing element wherein a center of a region (10a) receiving a force of the gauge portion (10) is located at a center of a region to which the force is applied (Fig. 1).

c. With respect to claims 11 and 12, Hollander teaches a force sensing element wherein the gauge portion (10) is formed such that the current path is formed in a crystal direction which exhibits a high sensitivity for a transmitted force (Col. 3, lines 17-33).

d. With respect to claim 13, Hollander teaches a force sensing element wherein the electrodes (16) include a first electrode (16/top) which is electrically connected to the gauge portion (10) and a second electrode (16/bottom) which is so formed on the other face (10a) of the semiconductor substrate (10) as to face the first electrode (16)(Fig.1)(Col. 3, lines 46-52).

5. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollander in view of Rocha et al. (4,546,658)(hereinafter Rocha). Hollander teaches all the

claimed limitations except a second semiconductor substrate which is joined on the side of one main face thereof to the gauge portion of the first semiconductor substrate and a second electrode which is formed on the second semiconductor substrate. Rocha teaches a second semiconductor substrate (12) which is joined on the side of one main face (15b) thereof to the gauge portion (14) of the first semiconductor substrate (11) and a second electrode (18) which is formed on the second semiconductor substrate (12)(Fig.2). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Hollander to include the above limitations as taught by Rocha in order to more effectively be responsive to forces applied to the sensing element (see Rocha; Col. 3, lines 35-52).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Takisha Miller whose telephone number is (571) 272-2184. The examiner can normally be reached on Monday - Friday (7:00 am - 3:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HARSHAD PATEL
PRIMARY EXAMINER